

Application No.: 10/049,499
Attorney Docket No.: FUK-89
Amendment Dated: October 5, 2005
Reply for Office Action Dated: 12 April 2005

REMARKS

Claims 1-7 are pending in the application.

Claims 6-7 have been cancelled herein.

The Office Action Summary page has marked item no. 10 pertaining to the drawings. However, no other indication is supplied (i.e., accepted or objected) to inform Applicant of how to reply. The Action itself contains no reference to the drawings from which Applicant could ascertain which selection applies to item no. 10.

Claims 1 and 4 have been amended. No new matter is added by the claim amendments. The claim amendments are fully supported by the original disclosure, e.g., the substitute specification filed 21 June 2002 at Fig. 1; Page 4, line 24 to Page 5, line 5; Page 11, line 11 to Page 12, line 22 (Page 12, lines 13-22 particularly); Page 14, line 19 to Page 15, line 11; Page 16, lines 18-26.

Claims 8-13 have been newly added herein. No new matter is added with the new claims.

Claims 4 and 5 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 4 and 5 have been amended.

In view of the foregoing, Applicant submits that the rejection has been overcome and requests that the rejection be withdrawn.

Claim 1 stands rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,683,529 to Makihara et al. ("Makihara").

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In the invention, as illustratively depicted in Fig. 1, a gas 13 is flowed over the spaced-apart arrangement of outer layers (4a, 4b), inner layer 6, and prepreg 5 for the purpose of eliminating moisture from the layers, which reduces the pressure needed to create and maintain the adhesion in the following step. Another effect of the gas is that of generally eliminating impurities (of which water may be one) from the surfaces of the structures. Following this gas flow operation, the structures are laminated to form a lamination, and then the lamination is pressurized/heated to set the prepreg and form a multilayered printed circuit board. Accordingly, in the invention, the gas flow operation to remove impurities occurs prior to both the lamination and the pressurizing/heating operations.

However, in Makihara, the gas flow operation cited by the Examiner occurs as part of the firing operation, which occurs after the lamination is formed. (As known, the firing operation applies a heat treatment to the lamination in a pressurized nitrogen gas atmosphere, for example, at elevated temperatures.)

Makihara states as follows in relevant part (emphasis added):

A process of producing a multiple-layer circuit board of aluminum nitride, including the steps of: preparing green sheets of aluminum nitride, forming on the green sheets conductor patterns of a conductor paste containing tungsten as a main conductor component, laminating the green sheets with the conductor patterns formed thereon to form a lamination, and firing the lamination in a container made of boron nitride and in a pressurized nitrogen gas atmosphere. (Abstract.)

1. A process of producing a multiple-layer circuit board of aluminum nitride, comprising the steps of:
preparing green sheets of aluminum nitride;
forming, on said green sheets, conductor patterns of a conductor paste containing tungsten powder as a main conductor component;
laminating said green sheets with said conductor patterns formed thereon to form a lamination; and

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firing said lamination ... (Claim 1 at Col. 9, lines 9-18.)

Eight pieces of the green sheet were laminated at a temperature of 60° C. and a pressure of 50 MPa to form an 8-layer lamination. After being dried, the laminations were degreased in a nitrogen gas flow at 600° C. for 4 hours to remove the organic binder, placed in a BN container, and fired at a temperature of 1700° C. in pressurized nitrogen gas atmospheres of 1 to 10 atm for 9 hours to form multiple-layer AlN circuit boards. (Col. 4, lines 29-39.)

In Makihara, unlike the invention, there is no gas flow over the layers (green sheets) prior to laminating the green sheets to increase adhesion qualities. In Makihara, the purported gas flow (pressurized nitrogen gas atmosphere) occurs after the laminating process, i.e., as part of the firing operation.

Accordingly, Applicant submits that Makihara does not identically disclose, inter alia, the recitations in Claim 1 (as amended) directed to "before conducting the laminating and the pressurizing/heating operations, flowing a gas over and into contact with the surfaces of the stacked formation." (The stacked formation is provided by the step of "stacking up in spaced-apart relationship at least one outer layer, at least one inner layer, and at least one prepreg to form a stacked formation.")

In view of the foregoing, Applicant believes that Claim 1 is patentable over Makihara and respectfully requests that this rejection be withdrawn.

Claims 2-5 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Makihara et al.

Applicant believes that Claims 2-5 are patentable over Makihara for reasons similar to those presented above in connection with the rejection of Claim 1 over Makihara.

Accordingly, Applicant respectfully requests that this rejection be withdrawn.

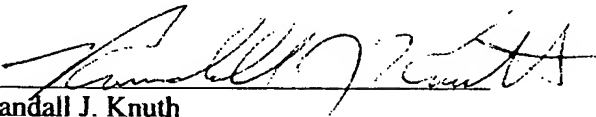
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Applicant believes that the application is in condition for allowance and respectfully requests favorable action in accordance therewith.

The Hon. Commissioner is hereby authorized to debit any fees and/or credit any overpayments to the undersigned's deposit account, RANDALL J. KNUTH, P.C., account no. 501157.

If the Examiner has any questions or comments that would advance prosecution of this case, the Examiner is invited to call the undersigned at 260/484-4526.

Respectfully Submitted,


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RJK/jrw2

Enclosures: Amendments to the Claims
(3 Sheets)
Explanatory Cover Sheet - Page 1
Petition for Extension of Time
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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450.
on: October 5, 2005


Randall J. Knuth, Registration No. 34,644

October 5, 2005

Date